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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/022,943	12/18/2001	Paul Edward Gorday	CM03638J	2584

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EXAMINER	
AGHDAM, FRESHTEH N	

ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 09/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/022,943	GORDAY ET AL.
	Examiner	Art Unit
	Freshteh N. Aghdam	2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6, 11,12, 14, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the instant application's disclosed prior art and further in view of Maru (US 2002/0031109) and Ramberg et al (US 6,741,638).

As to claims 1, 12, and 14, the instant application's disclosed prior art teaches a transmitter for generating first and second modulation signals in response to first and second input data symbols in a communication system comprising code sequence generators (Fig. 1, means PN I and PN Q) and generating a first and second encoded sequences (Fig. 1; Pg. 4, Lines 11-19). The instant application's disclosed prior art is silent about a memory for storing a code sequence; a first circular shifting means for circular shifting the code sequence by a first circular shift, said circular shift being determined by said first data symbol, said first shifting means being coupled to said memory; and a second circular shifting means for reversing and circular shifting the code sequence by a second circular shift, said circular shift being determined by said second data symbol, said second shifting means being coupled to said memory. Maru teaches a first shifting means for shifting the code sequence by a first shift, wherein the

first shift being determined by the first symbol (Fig. 6, means 14, 13, and 10-1); and a second shifting means for reversing (Fig. 10) and shifting the code sequence by a second circular shift, wherein said second circular shift being determined by the second data symbol (Fig. 6 and 10; means 14, 13, 10-2; par. 51). One of ordinary skill in the art would clearly recognize that it is well known in the art to use memory for storing data; and also, bi directional registers are well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Maru with the instant application's disclosed prior art in order to use a common PN (i.e. pseudorandom noise) to reduce the hardware used in the device. Ramberg teaches circular shifting the PN sequence (Col. 3, Lines 23-36). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Ramberg with Maru and the instant application's disclosed prior art in order to allow for the transmission of several bits of digital data for each period of the spreading sequence, which reduces the duration of transmitted packets and which, in turn, improves the efficiency of devices in the wireless network (Col. 4, Lines 41-46).

As to claim 2, the instant application's disclosed prior art teaches the transmitter further comprises a quadrature modulator for generating transmitted signal in response to the first and second modulation signals (Fig. 1; Pg. 4, Lines 11-19).

As to claims 3 and 15, the instant application's disclosed prior art teaches a radio frequency signal generator for generating a in-phase and quadrature radio frequency signals; a first and second multipliers for multiplying the in-phase and quadrature radio frequency signals with first and second modulation signal to produce the modulated in-

phase and quadrature signals and a summer for summing the in-phase and quadrature signals to produce an output signal (Fig. 1, Pg. 4, Lines 11-19). One of ordinary skill in the art would clearly recognize that the quadrature signal has 90 degrees phase difference with the in-phase signal.

As to claims 4 and 16, the instant application's disclosed prior art teaches a means (Fig. 1, means DEMUX) for converting an input bit-stream into a sequence of first and second input data symbols and said receiver further comprises a means (Fig. 2, means MUX) for converting said first and second output data symbols into an output chip stream.

As to claim 5, the instant application's disclosed prior art teaches the code sequence comprises M-chips (i.e. maximal sequence). Ramberg teaches circular shifting the PN sequence. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Ramberg with Maru and the instant application's disclosed prior art in order to allow for the transmission of several bits of digital data for each period of the spreading sequence, which reduces the duration of transmitted packets and which, in turn, improves the efficiency of devices in the wireless network.

As to claim 6, the instant application's disclosed prior art teaches first and second pulse shapers for converting said first and second encoded sequences into said first and second modulation signals (Fig. 1).

As to claim 11, the instant application's disclosed prior art teaches a transmitter for generating first and second modulation signals in response to first and second input data symbols in a communication system comprising code sequence generators (Fig. 1,

means PN I and PN Q) and generating a first and second encoded sequences (Fig. 1; Pg. 4, Lines 11-19). The instant application's disclosed prior art is silent about a memory for storing a code sequence; a first circular shifting means for circular shifting the code sequence by a first circular shift, said circular shift being determined by said first data symbol, said first shifting means being coupled to said memory; and a second circular shifting means for reversing and circular shifting the code sequence by a second circular shift, said circular shift being determined by said second data symbol, said second shifting means being coupled to said memory. Maru teaches a first shifting means for shifting the code sequence by a first shift, wherein the first shift being determined by the first symbol (Fig. 6, means 14, 13, and 10-1); and a second shifting means for reversing (Fig. 10) and shifting the code sequence by a second circular shift, wherein said second circular shift being determined by the second data symbol (Fig. 6 and 10, means 14, 13, 10-2; par. 51). One of ordinary skill in the art would clearly recognize that it is well known in the art to use memory for storing data. Furthermore, Maru teaches a receiver memory for storing a code sequence and assigning the shifted version of the code sequence to a first correlator (Fig. 6, means 13 and 14); the first correlator coupled to said receiver memory for determining the correlation between a shifted version of the code sequence and the complex modulated signal (Fig. 6, means 10-1); and second correlator coupled to said receiver memory for determining the correlation between an assigned shifted and time reversed version of said code sequence and said complex modulated signal (Fig. 6, means 14, 13, and 10-2; Fig. 10; Par. 51). Maru is silent about circular shifting the code sequence to be correlated with

the complex modulated signal. One of ordinary skill in the art would clearly recognize that bidirectional shift registers are well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Maru with the instant application's disclosed prior art in order to use a common PN (i.e. pseudorandom noise) to reduce the hardware used in the device. Ramberg teaches circular shifting the PN sequence (Col. 3, Lines 23-36). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Ramberg with Maru and the instant application's disclosed prior art in order to allow for the transmission of several bits of digital data for each period of the spreading sequence, which reduces the duration of transmitted packets and which, in turn, improves the efficiency of devices in the wireless network (Col. 4, Lines 41-46).

Claims 7-8, 13, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maru, and further in view of Ramberg.

As to claims 7 and 17, Maru teaches a receiver memory for storing a code sequence and assigning the shifted version of the code sequence to a first correlator (Fig. 6, means 13 and 14); the first correlator coupled to said receiver memory for determining the correlation between a shifted version of the code sequence and the complex modulated signal (Fig. 6, means 10-1); and second correlator coupled to said receiver memory for determining the correlation between an assigned shifted and time reversed version of said code sequence and said complex modulated signal (Fig. 6, means 14, 13, and 10-2; Fig. 10; Par. 51). Maru is silent about using a bidirectional shift register to shift the code sequence and circular shifting the code sequence to be

correlated with the complex modulated signal. One of ordinary skill in the art would clearly recognize that bidirectional shift registers are well known in the art. Ramberg teaches circular shifting the PN sequence (Col. 3, Lines 23-36). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Ramberg with Maru in order to allow for the transmission of several bits of digital data for each period of the spreading sequence, which reduces the duration of transmitted packets and which, in turn, improves the efficiency of devices in the wireless network (Col. 4, Lines 41-46).

As to claims 8,18, and 19, Maru teaches a receiver comprising an M chip shift register for storing and shifting an M chip code (Abstract); a complex modulated signal. One of ordinary skill in the art would clearly recognize that using memory for storing data is well known in the art. A first multiplier (Fig. 6, means 10-1) means for multiplying the code sequence stored in the M-chip shift register by the complex modulated signal to generate the first multiplier output; a first summer (Fig. 6, means 10-1) for summing the first multiplier outputs to produce a first correlation signal; a second multiplier means (Fig. 6, means 10-2) for multiplying the reverse of the code sequence (Fig. 10) stored in the M chip shift register by the complex modulated signal to generate the second multiplier outputs (Fig. 6, means 10-2); and a second summer (Fig. 6, means 10-2) for summing the second multiplier outputs to produce a second correlation signal. One of ordinary skill in the art would clearly recognize that vector multiplication is well known in the art.

As to claim 13, Maru teaches a receiver memory for storing a code sequence and assigning the shifted version of the code sequence to a first correlator (Fig. 6, means 13 and 14); the first correlator coupled to said receiver memory for determining the correlation between a shifted version of the code sequence and the complex modulated signal (Fig. 6, means 10-1); and second correlator coupled to said receiver memory for determining the correlation between an assigned shifted and time reversed version of said code sequence and said complex modulated signal (Fig. 6, means 14, 13, and 10-2; Fig. 10; Par. 51); a peak detector for detecting a peak in said correlation signal; and means responsive to said peak detector and said M chip (Abstract) shift registers (Fig. 6 and 7). Maru is silent about using a bidirectional shift register to shift the code sequence and circular shifting the code sequence to be correlated with the complex modulated signal. One of ordinary skill in the art would clearly recognize that bidirectional shift registers are well known in the art. Ramberg teaches circular shifting the PN sequence (Col. 3, Lines 23-36). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Ramberg with Maru in order to allow for the transmission of several bits of digital data for each period of the spreading sequence, which reduces the duration of transmitted packets and which, in turn, improves the efficiency of devices in the wireless network (Col. 4, Lines 41-46).

Claims 9 and 21 rejected under 35 U.S.C. 103(a) as being unpatentable over Maru and Ramberg, further in view of Kamerman et al (US 5,909,462).

As to claim 9, Maru and Ramberg teach all the subject matters claimed above, except for a first peak detector for detecting a peak in the first correlation signal; means

responsive to the first peak detector and the receiver memory for recovering the first output data symbol; a second peak detector for detecting a peak in the second correlation signal; and means responsive to the peak detector and the receiver memory for recovering the second output symbol. Kamerman, in the same field of endeavor, teaches a receiver comprising a first peak detector (i.e. in-phase component) for detecting a peak in the first correlation signal (Fig. 3); means responsive to the first peak detector and the receiver memory for recovering the first output data symbol; a second peak detector (i.e. quadrature component) for detecting a peak in the second correlation signal; and means responsive to the peak detector and the receiver memory for recovering the second output symbol (Fig. 3, means 345, 360, and 365; Col. 9, Lines 9-21). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Kamerman with Maru and Ramberg in order to allow the receiver to detect the data contained in the data more reliably under the degraded channel conditions (Abstract).

As to claim 21, Maru and Ramberg teach the subject matters claimed above, except for the receiver comprising passing the complex code position modulated signal through a matched filter. Kamerman teaches a matched filter (Fig. 3, means 350) that the modulated signal is passed through it. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Kamerman with Maru and Ramberg in order to allow the receiver to detect the data contained in the data more reliably under the degraded channel conditions (Abstract).

Claims 10 and 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Maru and Ramberg, further in view of the instant application's disclosed prior art.

As to claims 10 and 20, Maru and Ramberg teach all the subject matters claimed above, except for the receiver includes a quadrature down converter for converting a received modulated signal into the complex modulated signal. The instant application's disclosed prior art teaches a receiver comprising a quadrature down converter for converting a received modulated signal into the complex modulated signal (Fig. 4, means 404; Pg. 6, Lines 1-4). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of the instant application's disclosed prior art with Maru and Ramberg in order to recover the in phase and quadrature components of the signal which are represented as the complex modulated signal (Pg. 6, Lines 3 and 4).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Freshteh N. Aghdam whose telephone number is (571) 272-6037. The examiner can normally be reached on Monday through Friday 9:00-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is (571) 237-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Freshteh Aghdam
August 27, 2005

KEVIN BURD
PRIMARY EXAMINER